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ABSTRACT

The position of women in South Australia's process manufacturing industry was examined, and the implications of the study findings for the vocational education and training (VET) sector were discussed. Of the 393 companies to which surveys were sent, 136 (35.8%) returned valid responses. Of the 8,000 people employed in the industry, only 26.1% were women. Women tended to be clustered in low-skilled production jobs, and their representation in supervisory positions was limited. Women were more likely to be employed on part-time and casual bases and to have very limited career paths. The evidence suggested that the masculine environment that women encounter in both the training and work environments is a barrier to their advancement in the process manufacturing industry. It was recommended that real career paths for women, covering the range of occupations in the process manufacturing industry, be encouraged. Working with firms in the industry to promote and educate them in the benefits to be gained by drawing on the diverse range of skills and knowledge in all their employees, including women, was suggested as a way to advance access and equity for women in the manufacturing work force and to encourage more women to pursue apprenticeships and traineeships. (Contains 40 references.) (MN)

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The position of women in production in the process manufacturing industry in South Australia: implications for VET

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Manufacturing Learning SA (South Australia)

As part of a wider industry study undertaken by the process manufacturing ITAB, the position of women in production was surveyed. The findings indicate a discriminatory pattern of employment for women, who comprise approximately a quarter of the workforce. Women are more likely than men to be employed in part-time and casual positions and their access to traineeships is limited.

Women tend to be clustered in low-skilled production jobs and their representation in supervisory positions is limited. The reasons for women's exclusion from high skilled production jobs and the implications for their access to VET are considered. The problem is not just one of equity, but whether industry is fully utilising the skills of the workforce.

Background: changing employment patterns in Australia

Prior to the 1980s, Australian industry operated in a highly insulated, regulated economy and the manufacturing sector was protected by high tariffs. The deregulation of the economy and the sweeping tariff reforms associated with it exposed Australian industry to the global economy. The need to become internationally competitive forced Australian industry to adopt world best practices in terms of productivity and performance in order to survive (Winley 1994, p 11).

Significant labour market changes were associated with the reforms of the 1980s. In order to improve productivity and performance, a more flexible workforce was required. The decline of secure, full-time jobs and a rise in part-time and casual employment and an increase in the participation of women in the workforce were the main features of the labour market changes (ACIRRT 1999; Lansbury 1998). Between 1966 and 1994, part-time employment grew by 5.5% per annum; more than 3.5 times the growth in full-time employment of 1.5% per annum (ACIRRT 1999, p 136). By 1995, more than a quarter of the workforce was employed part-time, with women comprising 74% of all part-time workers (Lansbury 1998, p 140). About a quarter of the workforce were casuals. Between 1984 and 1997, the proportion of male casuals increased from under 10% to nearly 21%. The proportion of female casuals increased from 26% to 32% (ACIRRT 1999, p 140).

> The reforms have also led to a growing divide in the earnings distribution. Industry restructuring and downsizing has resulted in the decline of middle income jobs and their replacement by low wage jobs. Between 1976 and 1990, employment growth became concentrated at the top and bottom ends of the earnings distribution. (Lansbury 1998, p 142)

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In the workforce in general, technological innovation is creating major changes in work practices. New technology is likely to eliminate some existing jobs and increase the skills required for remaining jobs. There will be proportionately fewer jobs for unskilled workers and the remaining jobs are likely to be more complex and require higher skill levels (Lansbury 1998, p 137; MacIntosh and Isbell 2000, p 6).

The manufacturing industry in Australia

Manufacturing can be defined as

> the physical or chemical transformation of materials or components into new products, whether the work is performed by power driven machines or by hand ... (Australian Bureau of Statistics 1993, p 47)

The Australian manufacturing industry produces thousands of different products requiring different degrees of transformation. The industry manufactures products ranging from those requiring simple transformations such as flour and cheese, to elaborately transformed products such as wire products, glassware, ceramic products, paints and medicines (Australian Bureau of Statistics 1999, p 6).

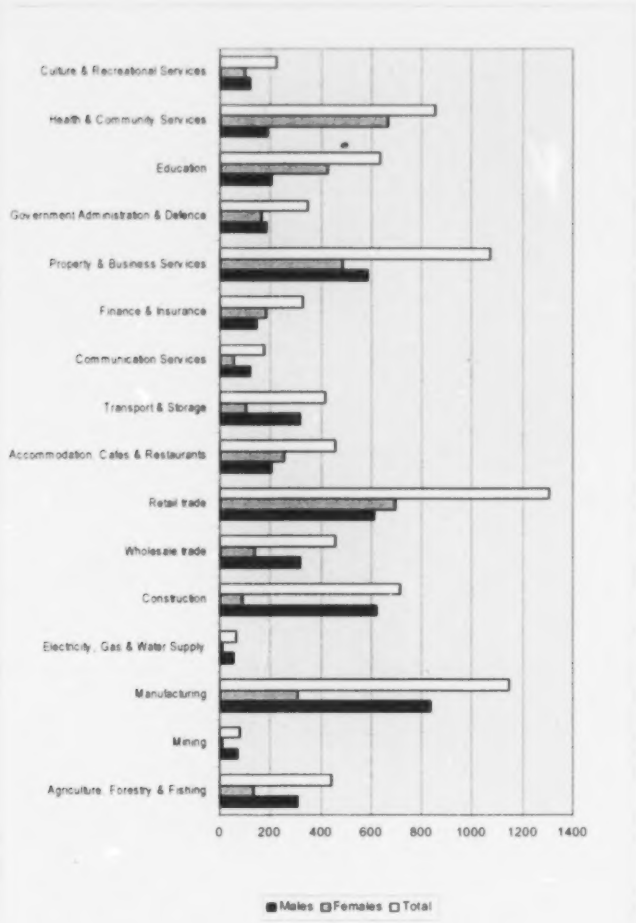
Manufacturing is a capital-intensive industry, using mechanised production methods which range from highly mechanised production lines using robotics to less complex activities such as concrete mixing (Australian Bureau of Statistics 1999, p 6).

Throughout its history, the industry has made a significant contribution to the Australian economy. It is the largest industry in terms of production volumes, but is one of the slowest growing. Over the 20 years to 1998-1999, it ranked sixteenth of 17 industries with an average annual growth of 1.8% (Australian Bureau of Statistics 1999, p 12). In terms of value, manufacturing production increased by 17% in the seven years to 1998-1999 (Australian Bureau of Statistics 1999, p 13).

The industry is dominated by a small number of large establishments. Though few in number, these establishments employ 47.1% of the manufacturing workforce and generate 57.3% of industry value added. Medium-sized establishments (those employing 20-99 people) account for 27.3% of the workforce and 24.2% of industry value added. There are a large number of small firms, which account for 25.6% of the workforce and 18.5% of the industry value added. The value added per person employed is greater in large establishments than in small ones (Australian Bureau of Statistics 1999, p 17).

The manufacturing industry is a significant employer as it accounts for 13.1% of all jobs in Australia. Manufacturing is the second largest employing industry in Australia. It is a male-dominated industry, with males outnumbering females by a ratio of about 3:1 (73% males and 27% female) (Australian Bureau of Statistics 2000). The total number of jobs in manufacturing is falling. In the 10 years to 1998, jobs declined by about 3% (National Centre for Vocational Education Research 1998, p 47). Figure 1 gives a graphical representation of employment in manufacturing compared with other industries.

Figure 1: Employed persons by industry



Source: Australian Bureau of Statistics 6203.0 Labour Force (August 2000, Table 46).

The process manufacturing industry sector

The process manufacturing industry sector comprises approximately 20% of total manufacturing. It includes a diverse range of products that contribute to final products in other sectors (Gilling 1998, p 95). The following four groupings make up the process manufacturing sector:

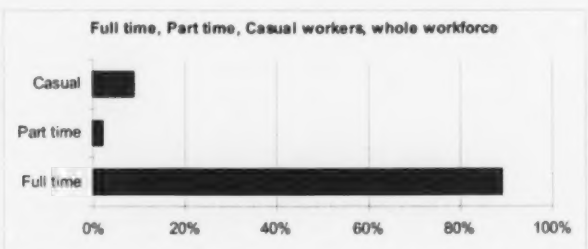
- Chemical, hydrocarbons and oil refining;
- Plastics, rubber and cablemaking;
- Non-metallic mineral products (which includes the building products of cement, concrete, glass and ceramics);
- Iron and steel

Employment profile of the process manufacturing sector in South Australia

The information presented here was collected as part of a wider survey of the process manufacturing industry sector in SA and its skill needs. This study was undertaken in 1999 and 2000 by Manufacturing Learning SA, the ITAB representing the process manufacturing industry sector in SA. The purpose of the study was to develop a profile of the sector and its skill needs in order to provide a guide to the implementation of vocational education in the sector. A survey, designed to provide basic data about the sector and its training activities and priorities, was mailed out to the 393 companies in the Manufacturing Learning SA's database. Of these, 136 valid responses were received, representing a response rate of 35.8% (MacIntosh and Isbell 2000, p 15). The data on employment patterns was collected as part of that survey.

The 136 companies surveyed in the process manufacturing sector employed almost 8,000 people in South Australia. Of these, 26.1% were women (MacIntosh and Isbell 2000, p 27). Figure 2 illustrates the employment profile in the process manufacturing sector. In common with the manufacturing industry in general, most of the workforce in process manufacturing (88.5%) is employed full time. Part-time employment is 1.9% and casual employment 8.3% of the workforce. Although full-time employment predominates, workforce flexibility is leading to an increasing trend towards casual employment (MacIntosh and Isbell 2000, p 26).

Figure 2: Employment profile of the process manufacturing sector

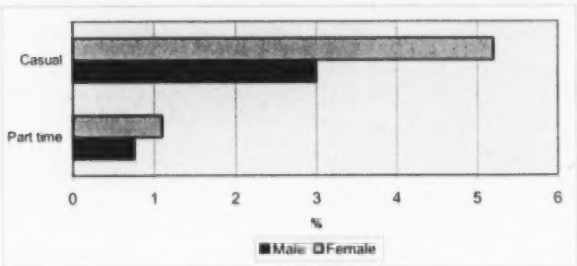


Source: MacIntosh and Isbell (2000, p 26).

In the manufacturing industry, the majority of males in the workforce were employed full time (95%) and 75% females were employed full time. Part-time employment is low, but females (6.8%) are more likely than males (3.6%) to be employed part time (Australian Bureau of Statistics 2000, Table 41, p 42).

A similar pattern of part-time and casual employment occurs in process manufacturing. Again, women are more likely than men to be employed in this manner. Of the 1.9 % of part-time employees, women comprise 1.1%. Of 8.3% of casual workers, women comprise 5.2%. This is illustrated in Figure 3.

Figure 3: Males and females in part-time and casual employment as a percentage of the whole workforce: process manufacturing sector (SA)



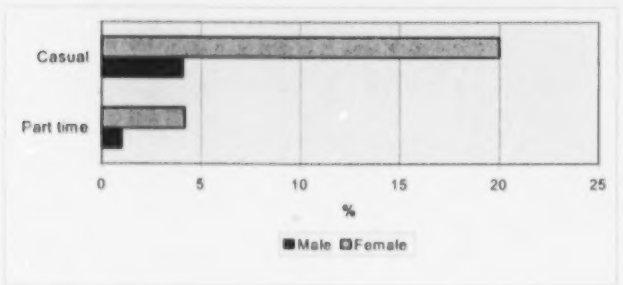
Source: MacIntosh and Isbell (2000, p 29).

The discriminatory pattern of employment in the manufacturing industry, where women are more likely than men to be employed in part-time positions, is further demonstrated by an examination of the percentages of women and men in part-time and full-time positions as a proportion of all women and men in the workforce.

Although Australian Bureau of Statistics data were not available for casual employees, an ACIRRT analysis suggests that the casual employment in the manufacturing industry is about 12% (ACIRRT 1999, p 139). Casual employment in the survey of the process manufacturing industry in South Australia (8.3%) is less than that for the broader manufacturing industry (MacIntosh and Isbell 2000, p 25).

Taking casual employment in the process manufacturing sector into account, the relative disadvantage that women encounter can be seen by an examination of the position of men and women in part-time and casual employment relative to the totals of men and women employees respectively. This is shown in Figure 4.

Figure 4: Men and women in part-time and casual employment relative to the totals of men and women employees: process manufacturing sector (SA)

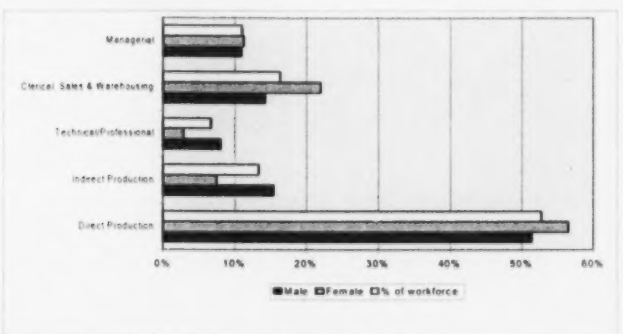


Source: MacIntosh and Isbell (2000, p 30).

Considering that women comprise just over a quarter of the workforce, they have a higher representation in these categories. Of all women, 32% are in casual jobs compared with 4.1% of men. For part-time work, 4.2% of all women are employed in this way, compared with only 1.0% of men (MacIntosh and Isbell 2000, p 30).

The disadvantage of women is further demonstrated by an examination of the occupations where they predominate. Figure 5 illustrates this. Women are concentrated in direct production (56.4%) and in clerical, sales and warehousing (22.0%). Only 7.4% are in indirect production and only 2.9% are employed in technical or professional occupations (MacIntosh and Isbell 2000, p 29).

Figure 5: Workforce employment profile by occupational group: process manufacturing sector (SA)



Source: MacIntosh and Isbell (2000, p 29).

Figure 5 indicates a low level of support for women in promotional positions in production (indirect employees) and in the technical and professional categories. While men (769) outnumber women (205) numerically in managerial positions, as a percentage of the proportion of men and women respectively, there appears to be

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little difference between the representation of each gender. However, this result needs to be treated with some caution, as the Managerial category is at the highest level of ASCO aggregation. This level represents all administrative, supervisory and managerial positions for non-production staff from the highest to the lowest level. As such, the apparent gender equality in this category should be regarded with scepticism. Given the gendered nature of the sector, it seems unlikely that women are represented equally at senior management levels. Future research will need to disaggregate this category in order to give a more accurate picture.

The pressures of globalisation leading to technological innovation have led to a decline in employment opportunities in the manufacturing industry. In the future, the industry is expected to make a significant contribution to Australia's wealth, but it is not expected to lead to an increase in employment (Gollan et al 1996, p 15). Similarly, employment in the process manufacturing sector in SA is expected to remain static overall (MacIntosh and Isbell 2000, p 32).

Impact on women

Selection processes

The pattern of women's employment in manufacturing may begin at job selection. Recruiters may select on the basis of stereotypes they hold about the job, the person and the interaction between the person and the job. Gender stereotypes may be perpetuated where jobs are seen as having masculine and feminine characteristics. Women may be systematically discriminated against in jobs that are seen to have masculine characteristics, such as physical strength (Heneman et al 1996, p 79). Gender-based roles tend to be carried over into work, particularly where one sex is in the majority in relation to the other. 'Sex-role spillover' results in women being considered as sex objects and harassed. Women in the minority role tend to be less frequently selected and, when selected, placed in traditionally female occupations (Heneman et al 1996, p 88).

> A European study of process manufacturing reported a division of labour based on gender, with labour intensive, low paid jobs undertaken by women, and more complex and better paid jobs undertaken with men. These divisions were attributed to the segregation by gender within the formal vocational education and training system prior to the time of job selection and entry. (Flecker et al 1998, p 28)

Types of jobs

> The study into the process manufacturing industry sector in South Australia indicated discriminatory patterns of employment for women. Not only were they more likely than men to be employed in part-time and casual positions, but they were also clustered in low paid, low skilled jobs (MacIntosh and Isbell 2000). This observation was also made in a study of manufacturing sites in New South Wales, where women were located in low skilled clerical jobs and "in the most routine of processing tasks" (Willett 1995, p 2). Similarly, a study of the plastics and chemicals sub-sectors reported that women were ... mainly employed in traditionally women's work like assembling, packing or sometimes machine operation. (Hooper and Hillier 1996, p 56)

There are numerous examples in the literature of the different patterns of employment between men and women; gender differences in the recognition of skills and the wages inequality are associated with this (Cockburn 1985; Jenson 1989; Wajcman 1991). Women tend to be clustered into a narrow band of industries and occupations and their wages tend to be lower than industries and occupations in which men predominate (Gardner 1994, p 2). In Australia, women predominate in two occupational categories: clerks and salespersons (30.6%), and personal service workers (Hampson et al 1994, p 247). The concentration of women in low paid, low skilled jobs is evidence that women's work and skills are undervalued relative to men's work and skills (Gardner 1994, p 2).

A study of wage patterns between 1986 and 1996 indicates that low skilled workers in manufacturing are disadvantaged. Male tradespeople earn more than male labourers and both earn significantly more than female labourers. Movements in pay have been uneven. The divide between the higher paid and lower paid workers, who do essentially the same work, is increasing. Female labourers are the lowest paid group in manufacturing (Buchanan and Watson 1997, pp 11-14). The many government policy initiatives directed at encouraging women into non-traditional occupations fail to address the position of the women who remain in low-paid, low-skilled jobs (Burgmann 1994, p 21).

In their efforts to move into high skilled, high paid jobs, women encounter structural impediments, such as 'the gender bias of the existing training infrastructure, unequal access to training and the devaluation of work traditionally undertaken by women' (Hampson et al 1994, p 247). The discriminatory pattern of women's employment in the manufacturing industry was institutionalised in the sexism of the apprenticeship system, which was defined by the exclusion of women. Efforts to overcome the masculine bias in the vocational education and training system dating from the 1970s have only been partially successful (Ewer 2000, p 39). When making vocational choices, women, aware of the gendering of occupations, avoid the male-dominated ones (Flecker et al 1998, p 32).

Job security

The last 25 years have seen a strong growth in the Australian workforce, the entry of women into paid employment and an increase in part-time and casual employment. These changes are predicted to continue into the future (Gollan et al 1996, p 12).

Much of the growth of part-time and casual employment has been in the service sectors, such as retailing and hospitality. The re-entry of women into the workforce, some of whom prefer not to work full time, partly accounts for the growth in this type of employment. Employers' demands for more flexible working arrangements has also made a significant contribution. The proportion of part-time workers who want to work more hours increased from 17% to 26% between 1986 and 1996. The shift towards part-time and casual employment and decline of full-time employment, therefore, represents a form of underemployment (ACIRRT 1999, p 136).

Of the reasons why people choose to work part-time, most women choose to do so for family reasons (18%) and most men for study reasons (22%). The remainder have no choice because

> ... overwhelmingly, for both men and women, the reason most people work part-time is because of work-related reasons, either because there is not enough work available or the job is only offered as a part-time job. (ACIRRT 1999, p 137)

The relationship between continuity of employment and skill development is important. Part-time jobs tend to be associated with the lower levels of the enterprise, involving only basic and non-transferable skills. Skill development and training are frequently not available to these employees (Knox and Pickersgill 1993, p 35). In terms of access to training, casual employees are disadvantaged, as employers are reluctant to invest in their training (MacIntosh and Isbell 2000, p 26). Casual employees are 11% less likely than non-casuals to receive job-related training. (ACIRRT 1999, p 141).

> While the prevalence of part-time and casual work in the process manufacturing sector is not as high as in the labour market in general, the South Australian survey found evidence of an increasing trend towards casualisation in the sector because of the flexibility it gives. (MacIntosh and Isbell 2000, p 29)

> The disproportionate representation of women in casual and part-time employment in manufacturing generally and in the process manufacturing sector limits their access to training and disadvantages them as far as skill development is concerned. (MacIntosh and Isbell 2000, p 30)

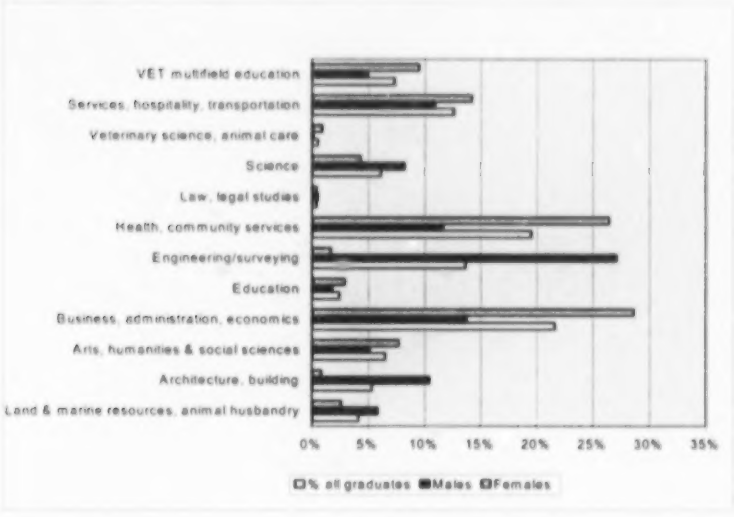
Access to apprenticeships and traineeships

Women have a long history of employment in manufacturing industries. During World War II, women worked as welders, assemblers and machine operators. Despite this and recent government policy initiatives to encourage women into non-traditional occupations, only a small percentage of women enter apprenticeships and traineeships in non-traditional areas (Stone 1998, p 192). Women make up only 12% of all apprentices (Australian National Training Authority 1997, p 17), and 5% of these apprenticeships are in hairdressing (Ewer 2000, p 39). The 7% of women in apprenticeships does represent a small increase of 4% since 1988, when only 3% of women were in apprenticeships other than hairdressing (Pocock 1988, p 81). This suggests that women's access to apprenticeships is improving overall. However, it is unlikely that this overall improvement is reflected in the manufacturing industry. An analysis of the NCVER's latest Student Outcomes Survey suggests that the participation of women in the category Engineering/Surveying is well below their participation in non-traditional areas overall. In manufacturing, many technical, trades and process operator qualifications would be included in Engineering/Surveying. However, females comprise only 1.7% of TAFE graduates from this category (NCVER 2000, Table 15, p 35). Figure 6 graphically illustrates the low participation of women in this category.

The gender segmentation of the workforce in manufacturing and in the process manufacturing sector is reflected in the low number of women in traineeships. The process manufacturing sector in SA is characterised by a very low number of trainees and apprentices. The Plastics and Rubber Products sub-sector had the highest

number of trainees and, according to the survey results, is the only sector with female trainees. Figure 7 illustrates the proportion of males and female trainees.

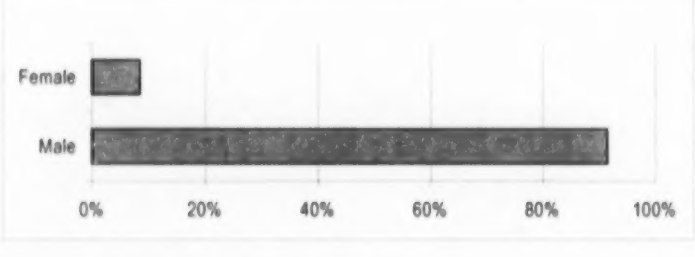
Figure 6: Males and females as a percentage of TAFE graduates by field of study



Source: NCVER Student Outcomes Survey 2000 National Report. Table 15: Percent of graduates by field of study.

An explanation for the low take-up of traineeships in the process manufacturing sub-sector may be the fact that, until recently, there was no formal qualification structure for the sector. The recently released National Training Packages for the sector is expected to lead to the uptake of training more widely and the further uptake of traineeships in the sector (MacIntosh and Isbell 2000, p 26). However, for women, research evidence suggests that little progress will be made unless an environment more conducive to women's participation is established.

Figure 7: Percentage of male and female trainees: process manufacturing sector (SA)



Source: MacIntosh and Isbell (2000, p 26).

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Possible explanations for the low take-up of apprenticeships and traineeships by women is because they often face a hostile environment and a lack of support (Stone 1998, p 192).

In her work, Pocock found that female apprentices working in non-traditional areas often found the experience daunting. Young female apprentices did not want special treatment, but they felt isolated in the TAFE environment. The masculine nature of TAFE and the attitude of some teachers was a barrier. Some teachers held strong sex stereotypes and, in some instances, expressed opposition to women's entry into some trades (Pocock 1988, p 82).

These barriers still seem to persist. In a recent study, Helen Connole reported that, in addition to the curriculum, women in non-traditional areas had to manage gender-related experiences with the training provider and employer staff. These women required high level interpersonal skills, determination and assertiveness during the course (Connole 2000, p 27). Connole also found instances of differential treatment between male and female students in trades courses (Connole 2000, p 41).

Pocock found that some employers preferred men in some occupations. In fact, some employers

> ... consistently refused to accept graduates or allow work experience opportunities for females in trades. (Pocock 1988, p 85)

The hostile work environment that Pocock found women often encountered seems to have changed little in the intervening years. Connole also observed that

> ... women in non-traditional trade training were attracted to the work itself but anticipated difficulty in continuing to work in their industries due to the hostile climate they encountered. (Connole 2000, p 14)

The masculine culture is a characteristic of manufacturing. A study of training needs in the manufacturing industry in New South Wales observed that several sites 'were hard core male domains riveted with entrenched attitudes, cultures and structures' (Willett 1995, p 1).

The masculine culture of the industry seems to present a significant barrier for the career progression of women. There seems to be a belief in the industry that career paths are the domain of the male breadwinner and many women in the industry do not see their jobs as careers. A possible cause is the incompatibility with women's lives and the way work is organised. Managers' unfamiliarity with training methods that assist individuals in career choices and their preference for directive forms of training where people 'are given information or told what to do' appears to be another contributing factor (Hooper and Hillier 1996, p 58). However, there is evidence that some women would prefer a career, not just a job (Hooper and Hillier 1996, p 59).

The impact of technology

Work organisation is being driven by the need to compete. The competition is principally from newly industrialised, low wage countries or from high technology western economies. Manufacturing establishments operating on a low wage basis

have largely gone offshore. Those operating in high technology markets have been required to increase the productivity and skills of the workforce (Gollan et al 1996, p 11).

Technological innovation is a significant factor in maintaining competitiveness and new technology is a significant factor in the demand for higher skill levels. The trend towards increasing skill levels driven by the use of more sophisticated computer-controlled production systems was a significant finding of the study of the process manufacturing industry in SA (MacIntosh and Isbell 2000, p 5).

Technological changes will continue to lead to increasing task specialisation in professional jobs, such as engineering. Multiskilling of shopfloor employees will be essential due to the increasing sophistication of production processes and also due to the increasing need for communication skills for workers at all skill levels (Gollan et al 1996, p 26). It is predicted that there will be some devolution of operational decision making to the shopfloor (Gollan et al 1996, p 25).

Technology at the very least puts downward pressure on the wages of unskilled workers and, in many instances, replaces unskilled labour. This leads to further cleavages in the income distribution between high and low skilled workers (Gollan et al 1996, p 13).

Another effect of technology is that workplace restructuring, where manual tasks are replaced, is often a consequence of the introduction of more sophisticated, high performance machinery. The consequence is workforce reduction and this affects marginalised workers, such as women, who are often the first to go. Women are forced to choose between family responsibilities and paid employment where high volume production is introduced with three-shift, seven-day work schedules (Flecker, et al 1998, p 32).

Technological change, especially in conjunction with new production methods, will require a smaller, but highly skilled and flexible workforce that is prepared to undertake ongoing training to facilitate the adaptation of skills to new technology (Wajcman 1991, p 28). In response to technological change in which knowledge of the machinery is required, new work practices emphasise small groups that work together, job rotation and workers' participation in regulating production (Jenson 1989, p 153).

The process involved is the constitution of work groups which can respond in a flexible way to the new automated work by adjusting quickly to changing needs of production, deploying effort where attention is needed at any moment and thus increasing both productivity and the intensity of labour. However, these new methods involve gender bias in their application. Whether such groups will include workers who are different is problematic. By their very form, work groups foster 'we/they' feelings and relationships. Differences tend to be excluded (Jenson 1989, p 154).

The importance of work groups, as well as the entrenched idea that womens' relationship to machinery differs from that of men, is significant when evaluating the differential gender effects of the new production methods. Workplace relations contribute to identities of gender, and work groups are a major place where that

occurs. Work teams are likely to be single-sex groups, for which gender difference becomes a boundary (Jenson 1989, p 153).

All this suggests that, without intervention, the future employment position of women in the manufacturing industry is likely to be further marginalised.

Diversity management

One intervention strategy, for which there is a sound business case, is based on the notion of utilising the skills of the whole workforce, and some enterprises are doing this to achieve sustained competitive advantage (Kossek and Lobel 1996).

The resources available to an enterprise, and its deployment of them, affect their performance in the market place. Companies that can lower their costs and enhance their differentiation will achieve competitive advantage. Differentiation based on product improvements or innovation requires an effective human resource capability (Wright et al 1995, p 272). The resources that people bring to an enterprise are their skills, knowledge, reasoning and decision-making abilities (Grant 1993, p 162). Enterprises that value and support their people because they are different can gain a competitive advantage (Wright et al 1995, p 272). Those that choose difference as a resource do so for economic reasons. They draw on the broader competence and experience that differentiates among workers. In such companies, diversity is a strategy for achieving a high-quality profile, giving better service to the customer and achieving higher profit levels (de las Reyes 2000, p 264).

In order to utilise the skills of all people, organisations undertake a strategic management process to manage diversity in the workforce. Emphasis is placed on developing the skills and creating policies and practices that get the best from each worker. Diversity management, then, is a

> ... process of creating and maintaining an environment that naturally allows all individuals to reach their full potential in pursuit of organisational objectives. (Dagher and D'Netto 1997, p 2)

Diversity management is based on the premise that white male culture gives way to one that respects individuality and difference (Thomas 1990, p 113). This is of interest where women are increasingly long-term participants in the workforce (Stone 1998, p 722).

The benefits that can be attributed to managing diversity include

- increased organisational effectiveness
- enhanced productivity
- improved morale (Thomas and Ely 1996, p 79)
- superior job performance
- reduced absenteeism
- reduced labour turnover (Wright et al 1995, p 272).

The retention of skilled workers can save businesses the cost of recruiting and training new staff, which is estimated to be between 20 and 150% of the annual

salary of an employee in some cases (Holmes 1994, p 17). Employee replacement costs include:

- the recruitment process (advertising and training new recruits)
- the diminished return on investment in training
- the cost of lost experience
- the extra cost of providing temporary staff to absorb the workload between departure and replacement (EOWA 2000, p 4).

Companies where diversity in the workforce is used for competitive advantage, and who manage it effectively, can be more profitable. A comparison, undertaken in the United States in 1993, of Standard and Poor's 500 firms, demonstrated that those recruiting and advancing women and minorities outperformed those that did not. The 100 firms with the best diversity management histories had average returns of 18.3% per annum over a five-year period, while the 100 firms with the worst histories had returns of only 7.9% per annum over the same period (Dass and Parker 1996, p 366).

Where productivity and profits depend on the full utilisation of the workforce, training is seen as a key method for eliminating artificial barriers to employee development and capability. Where the workforce is properly trained, diversity becomes an asset (Ford and Fisher 1996, p 165).

The work practices associated with technological innovation require a high degree of cooperation between team members. Diverse work groups have a broader range of knowledge, skills, abilities and experiences that can enhance the group's ability to analyse and solve problems. Such groups may produce a greater range of alternative solutions and make higher quality decisions. There is also some evidence that mixed-sex teams can outperform same-sex teams (Thompson and Gooler 1996, p 398).

Enterprises that have recognised that competitiveness can be achieved by utilising the skills of all employees include major United States companies such as Proctor and Gamble and Corning. Proctor and Gamble made a concerted effort to locate and recruit talented women and minorities. It recognised that to succeed as a company it needed 'an environment that makes it easy for all of us, not just some of us, to work to our potential'. By doing this, it was predicted that the company would be better and more competitive (Thomas 1990, p 113). Corning had higher attrition rates for women and minorities than it did for white males. This meant that investments in training and development were being wasted. It was found that the culture and values of the company worked against women. It established a diversity management program and career planning systems. These measures were taken to improve efficiency and competitiveness (Thomas 1990, p 110). An Australian example is Melbourne manufacturer Don Smallgoods. In order to fulfil its objective of using all of the available talent within the company, it has introduced a comprehensive training program to make it more inclusive of women and to raise the skill levels of the workforce (OTFE 1998, p 13).

Conclusion

Progress on women's representation in non-traditional areas has been slow. The evidence suggests that the masculine environment that women encounter both in the training and work environment is a barrier.

Women who are employed in manufacturing are more likely than men to be in part-time and casual jobs and have very limited career paths. It would be easy to dismiss this industry as too hard and direct access and equity efforts to new and emerging industries, where women do not face the strong tradition of male exclusivity and female exclusion from career paths that they do in manufacturing. However, manufacturing is the second largest employer in Australia. To dismiss it as an employment opportunity and career option for women would be to deny them access to a significant employer. This, in itself, would be a discriminatory recommendation. Therefore, the work of access and equity for women employed in manufacturing should continue.

Real career paths for women, covering the range of occupations in the industry, need to be encouraged. There is evidence to suggest that there are efficiency gains to be made by firms that utilise all the skills of their workers. The management of diversity can lead to competitive advantage and increased profitability. Diversity in the workplace becomes a valuable asset and training is a key lever in both the implementation of diversity management and in ongoing employee development.

A way to advance access and equity for women in the manufacturing workforce seems to be by working with firms in the industry to promote and educate them in the benefits to be gained by drawing on the diverse range of skills and knowledge in the people they employ. Where firms use diversity as an asset, training is a key requirement in the implementation and maintenance of diversity programs.

Firms that adopt policies of utilising and developing the skills of women in the workforce may lead to more women from the present workforce taking up apprenticeships and traineeships in non-traditional areas.

Further research will investigate the benefits to firms of fully utilising the skills of the workforce and develop strategies for promoting and implementing diversity management in industry. It will consider whether more women from within the current manufacturing workforce can be encouraged to take up apprenticeships and traineeships - and whether this provides access to a more diverse range of career paths for women in manufacturing.

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